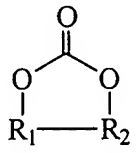
We Claim:

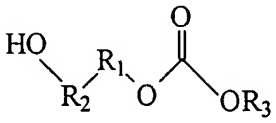
1. A process for the production of dialkyl carbonates and diols from cyclic carbonates, hydroxy alkyl carbonates and aliphatic monohydric alcohols comprising reacting said cyclic carbonate and said hydroxy alkyl carbonate with said aliphatic monohydric alcohol in the presence of a transesterification catalyst.

2. A process according to Claim 1, wherein said cyclic carbonate is of the formula:



(II)

said hydroxy alkyl carbonate is of the formula:



(III)

said aliphatic monohydric alcohol is if the formula:

R_4-OH

wherein R_1 and R_2 independently of one another denote a divalent group represented by the formula $-(CH_2)_m-$, wherein m is an integer from 1 to 3, which is unsubstituted or substituted with at least one substituent selected from the group consisting of C_1-C_{10} alkyl group and a C_6-C_{10} aryl group, wherein R_1 and R_2 can share the same substituent; and R_3 and R_4 independently of one another denote a monovalent aliphatic C_1-C_{12} hydrocarbon group which is

unsubstituted or substituted with at least one substituent selected from the group consisting of: a C_1-C_{10} alkyl group, a C_2-C_{10} vinyl group and a C_6-C_{10} aryl.

3. A process according to Claim 2, wherein said cyclic carbonate is ethylene carbonate, said hydroxy alkyl carbonate is 2-hydroxy ethyl methyl carbonate, said aliphatic monohydric alcohol is methanol, said dialkyl carbonate is dimethyl carbonate and said diol is ethylene glycol.

4. A process according to Claim 2, wherein said dialkyl carbonate comprises an unsymmetric dialkyl carbonate.

5. A process according to Claim 4, wherein said cyclic carbonate is ethylene carbonate, said hydroxy alkyl carbonate is 2-hydroxy ethyl ethyl carbonate, said aliphatic monohydric alcohol is methanol, said unsymmetric dialkyl carbonate is ethyl methyl carbonate and said diol is ethylene glycol.

6. A process according to Claim 2, wherein said dialkyl carbonate comprises a mixture of an unsymmetric dialkyl carbonate and a symmetric dialkyl carbonate.

7. A process according to Claim 6, wherein said cyclic carbonate is ethylene carbonate, said hydroxy alkyl carbonate is a mixture of 2-hydroxy ethyl methyl carbonate and 2-hydroxy ethyl ethyl carbonate, said aliphatic monohydric alcohol is methanol, said dialkyl carbonate is a mixture of dimethyl carbonate and ethyl methyl carbonate and said diol is ethylene glycol.

8. A process according to Claim 1, wherein said transesterification catalyst is at least one catalyst selected from the group consisting of a heterogeneous catalyst and a homogeneous catalyst.

9. A process according to Claim 1, wherein the reaction is carried out in the presence of a heterogeneous transesterification catalyst and in a fixed bed flow reactor.

10. A process according to Claim 9, wherein the reaction occurs at a temperature in the range of from about 20 to 300 °C and a pressure of from about 14 to 4000 psig.

11. A process according to Claim 1, wherein the reaction occurs at a temperature of at least about 250 °C.

12. The process according to Claim 1, wherein the molar ratio of said hydroxy alkyl carbonate to said cyclic carbonate is in the range between about 0.01:1,000 to about 0.01:100.

13. The process according to Claim 12, wherein said molar ratio of hydroxy alkyl carbonate to said cyclic carbonate is about 0.1:10.

14. The process according to Claim 1, wherein said aliphatic monohydric alcohol and said hydroxy alkyl carbonate have different alkyl groups.

15. The process according to Claim 1, wherein the molar ratio of said aliphatic monohydric alcohol to said cyclic carbonate equivalents is in the range between about 2:1 to about 6:1.

16. The process according to Claim 15, wherein the molar ratio of said aliphatic monohydric alcohol to said cyclic carbonate equivalents is in the range between about 3:1 to about 4:1.

17. The process according to Claim 3, wherein the reaction is conducted at a temperature between about 80 to 200 °C and a pressure between about 700 Kpa (100 psi) to about 2000 Kpa (300 psi).

18. The process according to Claim 17, wherein the conversion of said ethylene carbonate to said dimethyl carbonate is between about 30 to about 70%.

19. The process according to Claim 18, wherein the conversion of said ethylene carbonate to said dimethyl carbonate is between about 40 to 65%.

20. The process according to Claim 1, wherein the reaction occurs at a temperature of between about 50 to about 250 °C and a pressure of between about atmospheric to about 14,000 Kpa (2000 psi).

21. The process according to Claim 20, wherein the reaction occurs at a temperature of between about 75 to about 140 °C and a pressure of between about 140 Kpa (20 psi) to about 2,000 Kpa (300 psi).

22. A process according to Claim 1, wherein R_3 and R_4 are the same and said dialkyl carbonate is symmetric.

23. A process according to Claim 1, wherein R_3 and R_4 are different and said dialkyl carbonate is unsymmetric.

24. A process for the production of a dialkyl carbonate and a diol coproduct, said process comprising:

contacting at least one aliphatic monohydric alcohol and a mixture of a cyclic carbonate and an alkyl hydroxyalkyl carbonate in the presence of a transesterification catalyst at a temperature, pressure and a period of time sufficient to produce said dialkyl carbonate and said diol coproduct.

25. The process of claim 24, wherein said aliphatic monohydric alcohol is a mixture of two alcohols and said dialkyl carbonate is unsymmetric.

26. The process of claim 24, wherein said cyclic carbonate is selected from the group consisting of: ethylene carbonate, propylene carbonate, 1,2-butylene carbonate, 2,3-butylene carbonate, 1,1-dimethylethylene carbonate, 1,1,2- trimethylethylene carbonate, 1,1,2,2- tetramethylethylene carbonate, and a mixture thereof.

27. The process of claim 24, wherein said cyclic carbonate conversion is at least 5 %.

28. An integrated process for the production of a dialkyl carbonate and a diol from an alkylene oxide, carbon dioxide and an aliphatic monohydric alcohol comprising:

(a) reacting an alkylene oxide with carbon dioxide in the presence of a carbonation catalyst at a temperature in the range of about 50 to 250 °C and at a pressure of at least about 1379 kPa (200 psi) to provide a crude cyclic carbonate stream comprising a cyclic carbonate and carbonation catalyst; and

(b) reacting said cyclic carbonate and a hydroxy alkyl carbonate with said aliphatic monohydric alcohol in the presence of a transesterification catalyst, thereby producing a crude product stream comprising said dialkyl carbonate, said diol and said hydroxy alkyl carbonate; and

(c) separating said hydroxy alkyl carbonate from said crude product stream and recycling said hydroxy alkyl carbonate to step (b).

29. A process according to Claim 28, wherein said dialkyl carbonate comprises an unsymmetric dialkyl carbonate.

30. A process according to Claim 28, wherein reaction step (b) occurs at a temperature in the range of from about 20 to 300 °C and a pressure of from about 14 to 4000 psig.

31. A process according to Claim 28, wherein reaction step (b) occurs at a temperature of at least about 250 °C.

32. The process according to Claim 28, wherein the molar ratio of said hydroxy alkyl carbonate to said cyclic carbonate is in the range between about 0.01:1,000 to about 0.01:100.

33. The process according to Claim 32, wherein said molar ratio of hydroxy alkyl carbonate to said cyclic carbonate is about 0.1:10.

34. The process according to Claim 28, wherein said aliphatic monohydric alcohol and said hydroxy alkyl carbonate have different alkyl groups.

35. The process according to Claim 28, wherein the molar ratio of said aliphatic monohydric alcohol to said cyclic carbonate equivalents is in the range between about 2:1 to about 6:1.

36. The process according to Claim 35, wherein the molar ratio of said aliphatic monohydric alcohol to said cyclic carbonate equivalents is in the range between about 3:1 to about 4:1.

37. The process according to Claim 30, wherein said reaction step (b) is conducted at a temperature between about 80 to 200 °C and a pressure between about 700 Kpa (100 psi) to about 2000 Kpa (300 psi).

38. The process according to Claim 37, wherein the conversion of said ethylene carbonate to said dimethyl carbonate is between about 30 to about 70%.

39. The process according to Claim 38, wherein the conversion of said ethylene carbonate to said dimethyl carbonate is between about 40 to 65%.

40. The process according to Claim 28, wherein reaction step (b) occurs at a temperature of between about 50 to about 250 °C and a pressure of between about atmospheric to about 14,000 Kpa (2000 psi).

41. The process according to Claim 40, wherein said reaction step (b) occurs at a temperature of between about 75 to about 140 °C and a pressure of between about 140 Kpa (20 psi) to about 2,000 Kpa (300 psi).

42. A process according to Claim 28, wherein R_3 and R_4 are the same and said dialkyl carbonate is symmetric.

43. A process according to Claim 28, wherein R_3 and R_4 are different and said dialkyl carbonate is unsymmetric.